

Introduction

Chapter Overview

Within the U.S. civilian workforce, a group generically referred to as “scientists and engineers” consists of people educated in science (including life, physical, social, computer, and mathematical sciences) and engineering (S&E) and people who, although not educated in these fields, hold S&E occupations. This varied workforce includes technicians and technologists, researchers, educators, and managers of the S&E enterprise. Although these workers make up only a small fraction (less than 5 percent) of the total U.S. civilian workforce, their effect on society belies their number—scientists and engineers contribute enormously to technological innovation and economic growth, scientific and engineering research, and a greater understanding of S&E.

Chapter Organization

This chapter first presents a profile of the U.S. S&E workforce, including workforce size and various employment characteristics. Information on the sex and racial or ethnic composition of the S&E workforce is provided, followed by a description of labor market conditions for recent bachelor’s, master’s, and doctoral S&E degree recipients. Discussions on the effects of age and retirement on the S&E workforce and the projected demand for S&E workers over 2000–10 are presented. The chapter concludes by examining the global S&E workforce and the migration of scientists and engineers to the United States.

Profile of the U.S. S&E Workforce

Data in this section are from the National Science Foundation’s (NSF’s) Scientists and Engineers Statistical Data System (SESTAT), which is a unified database containing information on the employment, education, and demographic characteristics of scientists and engineers in the United States.¹

How Large Is the U.S. S&E Workforce?

Estimates of the size of the U.S. S&E workforce vary based on the criteria used to define a scientist or engineer. See sidebar, “Who Is a Scientist or Engineer?” Education, occupation, field of degree, and field of employment are all fac-

tors that may be considered.² For example, should any employee with an S&E education be considered a member of the S&E workforce, or should only someone employed in an S&E occupation be considered? In 1999, more than 13 million people in the United States either had an S&E education or were working as scientists or engineers. (See appendix table 3-2.) The number of college-degreed individuals in S&E fields in 1999 exceeded the number of individuals working in S&E occupations because many S&E degree-holders were not working in S&E fields. Also, many individuals who held S&E occupations were educated in fields not considered science or engineering.

Basic Characteristics

Including those either trained or working as scientists or engineers, approximately 13 million³ scientists and engineers were residing in the United States as of April 1999. However, only 84 percent (nearly 11 million) of these individuals were in the workforce. (See text table 3-1.) The remaining individuals were either unemployed but seeking work (193,200) or not in the workforce (1.86 million).

Of the nearly 11 million individuals trained or working as scientists and engineers in the United States in 1999, the vast majority (almost 10.5 million) had at least one college degree in an S&E field. About 30 percent (3.3 million) of the almost 10.5 million S&E degree-holders in the workforce were also employed in S&E occupations. The remaining one-half million individuals had college degrees in non-S&E fields but were currently or had been previously employed in S&E occupations. See sidebar, “Growth of the S&E Workforce.”

What Do People Do With an S&E Education?

Many U.S. scientists and engineers have multiple S&E degrees or have degrees in both S&E and non-S&E fields. Many S&E-educated workers also routinely find S&E-related employment in occupations not included within traditional S&E classifications. In 1999, of the 10.5 million S&E degree-holders in the workforce, about three-fourths (almost 8 million) reported that their highest degrees were in S&E fields. (See text table 3-1.) However, many of these individuals (approximately 5 million) were not employed principally in a science or engineering occupation.

Although the majority of S&E degree-holders do not work in S&E occupations, their S&E training does not necessarily go to waste. Of the 5 million S&E degree-holders perform-

¹SESTAT data are collected from three component surveys sponsored by NSF (*National Survey of College Graduates*, *National Survey of Recent College Graduates*, and *Survey of Doctorate Recipients*) and conducted periodically throughout each decade. SESTAT’s target population is U.S. residents who hold bachelor’s degrees or higher (in either an S&E or a non-S&E field) who, as of the study’s reference period, were noninstitutionalized, not older than age 75, and either trained or working as a scientist or engineer (e.g., either had at least one bachelor’s degree or higher in an S&E field or had a bachelor’s degree or higher in a non-S&E field and worked in an S&E occupation during the reference week. For the 1999 SESTAT, the reference period was the week of April 15, 1999.

²For a detailed discussion of the S&E degree fields and occupations in SESTAT, see NSF 1999a. A list of S&E occupations and fields is contained in appendix table 3-1. In general, S&E occupations and fields in this report include those in the field of social sciences and exclude medical practitioners and technicians (including computer programmers). Thus, a physician with an M.D. will not be considered to be “S&E” either by occupation or by highest degree, but he is likely (but not certainly) to be included in statistics that incorporate those with S&E degrees based on their field of bachelor’s degree.

³This number includes all those who received a bachelor’s degree or higher in an S&E field plus those holding a non-S&E bachelor’s degree or higher who were employed in an S&E occupation during either the 1993, 1995, 1997, or 1999 SESTAT surveys.